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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No. 0756-2028

First Inventor or Application Identifier: Ichiro TAKAYAMA et al.

Title: ACTIVE MATRIX TYPE FLAT-PANEL DISPLAY DEVICE

Express Mail Label No.

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO:

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1. ☒ Fee Transmittal Form (e.g., PTO/SB/17)
(Submit an original, and a duplicate for fee processing)
2. ☒ Specification Total Pages [20]
(preferred arrangement set forth below)
 - Descriptive title of the invention
 - Cross References to Related Applications
 - Statement Regarding Fed sponsored R & D
 - Reference to Microfiche Appendix
 - Background of the Invention
 - Brief Summary of the Invention
 - Brief Description of the Drawings (if filed)
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
3. ☒ Drawing(s) (35 USC 113) Total Sheets [5]
4. ☐ Oath or Declaration Total Pages []
 - a. ☐ Newly executed (original or copy)
 - b. ☐ Copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 17 completed)
[Note Box 5 below]
 - i. ☐ **DELETION OF INVENTOR(S)**
Signed statement attached deleting
inventor(s) named in the prior application,
see 37 CFR 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference (useable if Box 4b is checked)
The entire disclosure of the prior application, from which a
copy of the oath or declaration is supplied under Box 4b,
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accompanying application and is hereby incorporated by
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6. ☐ Microfiche Computer Program (Appendix)
7. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)
 - a. ☐ Computer Readable Copy
 - b. ☐ Paper Copy (identical to computer copy)
 - c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

8. ☐ Assignment Papers (cover sheet & document(s))
9. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney
(when there is an assignee)
10. ☐ English Translation Document (if applicable)
11. ☐ Information Disclosure Statement ☐ Copies of IDS
(IDS)/PTO-1449 Citations
12. ☒ Preliminary Amendment
13. ☒ Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)
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Statement(s) Status still proper and desired
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15. ☐ Certified Copy of Priority Document(s)
(if foreign priority is claimed)
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*A new statement is required to be entitled to pay small entity fees,
except where one has been filed in a prior application and is being
relied upon.

17. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment:

Divisional of prior application Serial No. 08/547,919 filed October 25, 1995.

Prior application information: Examiner:

Group/Art Unit: 2609

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Date: September 13, 1999

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re DIVISIONAL Application of)
Ichiro TAKAYAMA et al.)
Based On Serial No. 08/547,919) Art Unit: 2609
Which Was Filed: October 25, 1995) Examiner:
For: ACTIVE MATRIX TYPE)
FLAT-PANEL DISPLAY DEVICE) Date: September 13, 1999

PRELIMINARY AMENDMENT

Honorable Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Please preliminarily amend the subject application as follows:

IN THE SPECIFICATION:

Before the first sentence of the specification, insert --This application is
a Division of Application Serial No. 08/547,919 filed October 25, 1995.--

IN THE CLAIMS:

Please cancel claims 1-10 and add new claims 11-20 as follows:

--11. A display device comprising:

a substrate;

a plurality of light emissive elements arranged in a matrix form over said substrate;

a plurality of first thin film transistors formed over said substrate;

a plurality of second thin film transistors formed over said substrate and connected to said plurality of light emissive elements, respectively, wherein said one of second thin film transistors is connected to a gate of one of said first thin film transistors,

wherein each of said light emissive elements comprises an organic electroluminescent material.

12. The display device according to claim 11 further comprising a first shift register and a second shift register, electrically connected to said plurality of first thin film transistors.

13. The display device according to claim 11 further comprising a power supply line connected to said second thin film transistors.

14. An active matrix type organic luminescent display device comprising:

a substrate;

at least one first signal line and one second signal line intersecting to each other formed over said substrate;

a first thin film transistor formed over said substrate wherein said

first signal line is connected to a gate of said first thin film transistor and said second signal line is connected to source or drain of the first thin film transistor;

a second thin film transistor formed over said substrate wherein the other one of the source or drain of the first thin film transistor is connected to a gate of the second thin film transistor;

an organic electroluminescent element formed over said substrate and electrically connected to source or drain of said second thin film transistor; and

a power supply line electrically connected to the other one of the source or drain of the second thin film transistor.

15. The display device according to claim 14 wherein a video signal is applied to the gate of the second thin film transistor through said second signal line and said first thin film transistor.

16. The display device according to claim 14 wherein said power supply line extends in parallel with said second signal line.

17. An active matrix type organic luminescent display device comprising:

a substrate;

at least one first Signal line and one second signal line intersecting to each other formed over said substrate;

a first thin film transistor formed over said substrate wherein said first signal line is connected to a gate of said first thin film transistor and said

second signal line is connected to source or drain of the first thin film transistor;

a second thin film transistor formed over said substrate wherein the other one of the source or drain of the first thin film transistor is connected to a gate of the second thin film transistor;

an organic electroluminescent element formed over said substrate and electrically connected to source or drain of said second thin film transistor;

a power supply line electrically connected to the other one of the source or drain of the second thin film transistor; and

a capacitor formed between the gate of the second thin film transistor and the source or drain of the second thin film transistor to which said power supply line is connected.

18. The display device according to claim 17 wherein a video signal is applied to the gate of the second thin film transistor through said second signal line and said first thin film transistor.

19. The display device according to claim 17 wherein said power supply line extends in parallel with said second signal line.

20. The display device according to claim 17 further comprising a first shift register and a second shift register, electrically connected to said plurality of first thin film transistors.--

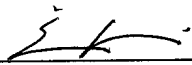
REMARKS

This application has been amended to include the continuing application data thereof.

New claims 11-20 have been added to complete the scope of applicant's protection.

Examination on the merits is requested.

Respectfully submitted,



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TITLE OF THE INVENTION

ACTIVE MATRIX TYPE FLAT-PANEL DISPLAY DEVICE

FIELD OF THE INVENTION

The present invention relates to an active matrix type flat-panel display device with light emissive elements such as EL (electro luminescent) elements or light nonemissive elements such as liquid crystal elements arranged two dimensionally in matrix and sequentially driven by means of respective drive thin film transistors (TFTs).

DESCRIPTION OF THE RELATED ART

An active matrix type flat-panel display device with light emissive elements and respective drive TFTs which are two dimensionally arranged along X-axis and Y-axis in matrix is known. In such device, the drive TFTs of the respective picture elements are sequentially scanned by column-selecting transistors (TFTs) and line-selecting transistors (TFTs). Each of the column-selecting transistors which are sequentially turned on by means of an X-axis shift register is connected to each column. The line-selecting transistors are prepared for the respective drive TFTs and sequentially turned on by means of a Y-axis shift register so that the line-selecting transistors connected to each line are simultaneously turned on.

According to such the device, since each of the column-selecting transistors has to drive all the drive TFTs on that column, it is necessary to use as a high power transistor as for this column-selecting transistor. Particularly, in case that the light emissive elements are constituted by high speed elements such as EL elements, high speed switching operation will be required by using extremely high power TFTs.

These high power TFTs for the column-selecting transistors result time constant determined by their large gate capacitance and on-resistance of circuits connected to the gates of the column-selecting transistors to extremely increase and thus cause rise edges and fall edges of selection signals applied to these respective gates to delay by a certain period ΔT . Therefore, a selection signal to be applied to one column-selecting transistor will overlap on a next selection signal to be applied to the next column-selecting transistor for the delay time ΔT causing the both of the neighboring column-selecting transistors to simultaneously keep on during this period ΔT . As a result, a video signal for a light emissive element positioned at a certain column and a certain line will be strayed into a next light element positioned at the neighboring column and the same line causing picture quality of the display device to deteriorate.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide an active matrix type flat-panel display device whereby picture quality can be greatly improved by preventing overlap between selection signals of neighboring columns or lines from occurring.

According to the present invention, an active matrix type flat-panel display device includes a flat substrate, a plurality of light emissive elements arranged two dimensionally along columns and lines on the flat substrate, a plurality of selection switches formed on the flat substrate, for sequentially selecting the light emissive elements to provide video signals thereto, selection signal generation circuits for providing selection signals which drive the selection switches in sequence so as to two dimensionally scan the light emissive elements, and a selection signal control circuit for preventing the selection signals to be outputted from the selection signal generation circuits for a predetermined period of time so as to eliminate overlap between the selection signals.

Thus, overlap between selection signals of neighboring columns or lines can be prevented from occurring causing picture quality to be greatly improved.

Preferably, the selection switches consist of column-selecting transistors arranged for the respective columns of the light emissive elements, and line-selecting transistors arranged for the respective light emissive elements.

The column-selecting transistors and the line-selecting transistors may be formed by thin film transistors.

It is preferred that the selection signal generation circuits include a first shift register for providing the selection signals in sequence to the column-selecting transistors, and a second shift register for providing the selection signals in sequence to the line-selecting transistors.

Preferably, the selection signal control circuit includes a mask signal generation circuit for producing a mask signal with a duration of time which corresponds to the predetermined period of time, and a logic circuit for shortening a duration of the selection signals by the duration of the mask signal.

The above-mentioned predetermined period time may be equal to 5 to 50 % of a half clock cycle.

The light emissive elements may consist of organic electro luminescent elements, non-organic electro luminescent elements, ferroelectric liquid crystal elements or field emission diodes.

Further objects and advantages of the present invention will be apparent from the following description of the preferred embodiments of the invention as illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 schematically shows a part of a preferred

embodiment of an active matrix type flat-panel display device according to the present invention;

Fig. 2 shows in detail a part of the display device of Fig. 1;

Fig. 3 shows a concrete constitution of a part of an X-axis shift register illustrated in Fig. 1;

Fig. 4 schematically shows a constitution of a clock signal and mask signal generation circuit;

Fig. 5 shows a concrete constitution of a mask signal generation circuit illustrated in Fig. 4;

Fig. 6 illustrates wave forms of a clock signal and a mask signal in the circuit of Fig. 4; and

Fig. 7 illustrates wave forms of various signals in the X-axis shift register of Fig. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Fig. 1 schematically shows a part of a preferred embodiment of an active matrix type flat-panel display device according to the present invention.

As illustrated in the figure, the display device 10 has a flat display panel 11, an X-axis shift register 12 and a Y-axis shift register 13.

The flat display panel 11 has a substrate (not indicated) and a plurality of picture elements of light emissive elements which are two dimensionally arranged along X-axis and Y-axis in

matrix on the substrate. In this embodiment, the light emissive elements are constituted by organic EL (electroluminescent) elements. To the respective picture elements of the display panel 11, EL power and video signal are supplied. To the X-axis shift register 12, shift register power and an X-axis synchronous signal are supplied. To the Y-axis shift register 13, shift register power and a Y-axis synchronous signal are supplied.

Fig. 2 is an enlarged view of a circled portion in Fig. 1. As will be apparent from this figure, each of the picture elements P_{11} , P_{12} , ..., P_{21} , P_{22} , ... (illustrated by rectangles of broken lines) of the flat display panel 11 is constituted by two TFTs, a capacitor and an EL element.

Light emitting operation of the picture element P_{11} for example will be carried out as follows. When a selection signal x_1 is outputted from the X-axis shift register 12 and a selection signal y_1 is outputted from the Y-axis shift register 13, a column-selecting transistor (TFT) T_{x1} and a line-selecting transistor (TFT) T_{y11} are turned on. Thus, the video signal -VL is applied to a gate of a drive transistor (TFT) M_{11} via the transistors T_{x1} and T_{y11} . Accordingly, a current with a value depending upon the gate voltage -VL flows from the EL power supply through drain and source of the drive transistor M_{11} causing an EL element EL_{11} of this picture element P_{11} to emit light with a luminance corresponding to the voltage of the

video signal -VL.

At a next timing, the X-axis shift register 12 puts off the selection signal x_1 and outputs a selection signal x_2 . However, since the preceding gate voltage of the transistor M_{11} is held by a capacitor C_{11} , the picture element P_{11} will keep to emit light with a luminance corresponding to the voltage of the video signal -VL until this picture element P_{11} is selected again.

Fig. 3 shows a concrete constitution of a part of the X-axis shift register 12 in the embodiment of Fig. 1.

In the figure, two-input NAND circuits 21 and 22 constitute an wave-form shaping circuit for shaping wave form of an input signal to synchronize with basic clocks. The NAND circuit 21 is connected such that inverse basic clocks -CL having inverted phase with respect to the basic clocks are inputted into one input terminal of the NAND circuit 21 and that an output signal from the NAND circuit 22 is inputted into the other input terminal thereof. The NAND circuit 22 is connected such that a start pulse -SP with low level (L-level) will be inputted into one input terminal of the NAND circuit 22 and that an output signal from the NAND circuit 21 is inputted into the other input terminal thereof. The start pulse -SP is an X-axis synchronous signal which defines a start time of scanning toward the column direction.

The output terminal of the NAND circuit 21 is connected to

an input terminal of a clocked inverter 26. This clocked inverter 26, clocked inverters 29 to 32 and inverters 33 to 37 constitute a shift register portion. Namely, each of stages of the shift register portion is formed as follows. The first stage is constituted by the clocked inverter 26, the inverter 33 connected to this clocked inverter 26 in series and the clocked inverter 29 connected to the inverter 33 in parallel but in opposite direction. The second stage is constituted by the clocked inverter 27, the inverter 34 connected to this clocked inverter 27 in series and the clocked inverter 30 connected to the inverter 34 in parallel but in opposite direction. The third stage is constituted by the clocked inverter 28, the inverter 35 connected to this clocked inverter 28 in series and the clocked inverter 31 connected to the inverter 35 in parallel but in opposite direction.

Inverters 38 to 43 and three-input NAND circuits 23 to 25 constitute a logic circuit portion for providing selection signals x1 to x3. An output terminal of the first stage of the shift register portion (output terminal of the inverter 33) is coupled with a first input terminal of the three-input NAND circuit 23 via the inverter 38. An output terminal of the second stage of the shift register portion (output terminal of the inverter 34) is coupled with a first input terminal of the three-input NAND circuit 24 via the inverter 39 and directly connected to a second input terminal of the NAND circuit 23.

An output terminal of the third stage of the shift register portion (output terminal of the inverter 35) is coupled with a first input terminal of the three-input NAND circuit 25 via the inverter 40 and directly connected to a second input terminal of the NAND circuit 24.

Third input terminals of the NAND circuits 23 to 25 are connected to a mask signal generation circuit 41 shown in Fig. 4 to receive a mask signal -INL. An output terminal of the NAND gate 23 is coupled with a gate of a first column switching transistor T_{x1} via the inverter 41. An output terminal of the NAND gate 24 is coupled with a gate of a second column switching transistor T_{x2} via the inverter 42. An output terminal of the NAND gate 25 is coupled with a gate of a third column switching transistor T_{x3} via the inverter 43. Into sources of the switching transistors T_{x1} to T_{x3} , video signal -VL is applied.

The clocked inverter will be in active and operate as an inverter when L-level signal is applied to a clock input terminal shown at upper side and also H-level signal is applied to an inverted clock input terminal shown at lower side. Contrary to this, it will turn into high impedance state when H-level signal is applied to the clock input terminal and L-level signal is applied to the inverted clock input terminal. For example, since the clocked inverters 26 and 29 are constituted to receive opposite phase clocks with each other as

shown in Fig. 3, the clocked inverter 26 will be in active when the clocked inverter 29 is in a high impedance state.

Fig. 4 schematically shows a constitution of a clock signal and mask signal generation circuit. Fig. 5 shows a concrete constitution of a mask signal generation circuit illustrated in Fig. 4, and Fig. 6 illustrates wave forms of a clock signal and a mask signal in the circuit of Fig. 4.

As shown in Fig. 4, the clock signal and mask signal generation circuit consists of a frequency divider 40 for dividing, by eight, frequency of a clock signal with eight-fold frequency, produced by a clock generator (not shown) to produce a basic clock signal CL, and a mask signal generation circuit 41 for producing a mask signal -INL from the clock signal with eight-fold frequency.

The frequency divider 40 may be constituted by a counter for counting the input clock signals to output the basic clock signal with H-level and L-level which alternate at every four input clock signals. Thus, the basic clock CL will have eight-fold pulse width in comparison with that of the input clock signal with eight-fold frequency as shown in Fig. 6.

As shown in Fig. 5, the mask signal generation circuit 41 consists of a three-bit counter 410 and a two-input NAND circuit 411 so as to count the input clock signal with eight-fold frequency for three clock cycles and provide an output signal with a one clock cycle duration of L-level. Thus, the

mask signal -INL having a predetermined mask period of time MK can be obtained. As will be apparent from Fig. 6, this mask period MK is equal to a quarter of half clock cycle. The mask period MK according to this invention is not limited to a quarter of half clock cycle but can be determined to an optional period equal to or longer than an overlapped period ΔT of the selection signals. In practice, it is desired to select the mask period MK between about 5 and 50 % of the half clock cycle.

Fig. 7 illustrates wave forms of various signals in the X-axis shift register of Fig. 3. Hereinafter, operation of this embodiment will be illustrated in detail.

Output voltage A from the wave-form shaping circuit will be maintained at H-level when the start pulse of L-level -SP is not inputted. When the start pulse of L-level is inputted, the voltage A falls to L-level. As shown in Fig. 7, the start pulse -SP which is somewhat delayed due to a possible capacitance of input lead wires is shaped by the wave-form shaping circuit (21, 22) to synchronize with the basic clock CL.

When the voltage A falls to L-level, state of the clocked inverter 26 changes into active and thus output voltage B from the clocked inverter 26 will rise to H-level. Output voltage C from the inverter 33 (output from the first stage of the shift register) has an opposite phase wave form as that of the

voltage B' due to the inverter 33.

When the state of the clocked inverter 26 changes into high impedance in next, since the clocked inverter 29 is in active, the voltage B is kept on H-level during this active period of the clocked inverter 29. Namely, the inverter 33 and the clocked inverter 29 constitutes a hold circuit.

Output voltage D from the clocked inverter 27 has an wave form delayed by a half clock cycle from that of the voltage B due to the operations of the clocked inverter 27 itself which simultaneously changes into active state with the clocked inverter 29 and of a hold circuit constituted by the inverter 34 and the clocked inverter 30.

Output voltage E from the inverter 34 (output from the second stage of the shift register) has an opposite phase wave form as that of the voltage D due to the inverter 34 and also has an wave form delayed by a half clock cycle from that of the voltage C.

Output voltage F from the clocked inverter 28 has an wave form delayed by a half clock cycle from that of the voltage D due to the operations of the clocked inverter 28 itself which simultaneously changes into active state with the clocked inverter 30 and of a hold circuit constituted by the inverter 35 and the clocked inverter 31.

Output voltage G from the inverter 35 (output from the third stage of the shift register) has an opposite phase wave

form as that of the voltage F due to the inverter 35 and also has an wave form delayed by a half clock cycle from that of the voltage E.

The voltage C is inverted by the inverter 38 and an inverted voltage H which is maintained H-level for a clock cycle is applied to a first input terminal of the three input NAND circuit 23. The voltage E having an wave form delayed by a half clock cycle from that of the voltage C is applied to a second input terminal of the NAND circuit 23. The mask signal -INL is applied to a third input terminal of the NAND circuit 23. The mask period MK of the mask signal -INL is determined to a certain period so that the falling edge of the selection signal x1 and the rising edge of the next selection signal x2 will not overlapped with each other.

Low-level duration of output voltage K from the NAND circuit 23 is shorter than that of the basic clock CL by the mask period MK. In other words, the output voltage K rises earlier than the basic clock CL by the mask period MK. This output voltage K is inverted by the inverter 41 to produce the selection signal x1.

The selection signal x1 is applied to the gate of the column-selecting transistor (TFT) T_{x1} which is formed by a N-channel field effect transistor. Thus, when the selection signal x1 rises to H-level, the transistor T_{x1} turns on.

The voltage E is inverted by the inverter 39 and an

inverted voltage I which is maintained H-level for a clock cycle is applied to a first input terminal of the three input NAND circuit 24. The voltage G having an wave form delayed by a half clock cycle from that of the voltage E is applied to a second input terminal of the NAND circuit 24. The mask signal -INL is applied to a third input terminal of the NAND circuit 24.

Low-level duration of output voltage L from the NAND circuit 24 is shorter than that of the basic clock CL by the mask period MK. In other words, the output voltage L rises earlier than the basic clock CL by the mask period MK. This output voltage L is inverted by the inverter 42 to produce the selection signal x2.

The selection signal x2 is applied to the gate of the column-selecting transistor (TFT) T_{x2} which is formed by a N-channel field effect transistor. Thus, when the selection signal x2 rises to H-level, the transistor T_{x2} turns on.

The voltage G is inverted by the inverter 40 and an inverted voltage J which is maintained H-level for a clock cycle is applied to a first input terminal of the three input NAND circuit 25. The voltage having an wave form delayed by a half clock cycle from that of the voltage G is applied to a second input terminal of the NAND circuit 25. The mask signal -INL is applied to a third input terminal of the NAND circuit 25.

Low-level duration of output voltage M from the NAND circuit 25 is shorter than that of the basic clock CL by the mask period MK. In other words, the output voltage M rises earlier than the basic clock CL by the mask period MK. This output voltage M is inverted by the inverter 43 to produce the selection signal x_3 .

The selection signal x_3 is applied to the gate of the column-selecting transistor (TFT) T_{x3} which is formed by a N-channel field effect transistor. Thus, when the selection signal x_3 rises to H-level, the transistor T_{x3} turns on.

Similar to this, the selection signals x_1 , x_2 , x_3 ,... which are sequentially shifted by a half clock cycle with each other can be provided.

As described before, the wave forms of these selection signals x_1 , x_2 , x_3 ,... shown in Fig. 7 by solid lines are ideal wave forms and actual wave forms applied to the respective gates of the transistors T_{x1} , T_{x2} , T_{x3} ,... may be as shown in Fig. 7 by broken lines. Namely, rising edges and falling edges of the selection signals may delay by a certain period ΔT due to the large gate capacitance of the transistors T_{x1} , T_{x2} , T_{x3} ,... and on-resistance of the inverters 41, 42, 43,....

However, according to the present invention, since the mask period MK during which no H-level signal is existed is provided between the selection signals, the switching transistor for example T_{x1} and the next switching transistor

for example T_{x2} never simultaneously be in on state.

Therefore, according to the present invention, picture quality of an active matrix type flat-panel display device can be greatly improved by preventing overlap between selection signals of neighboring columns or lines from occurring.

The light emissive elements may be constituted by non-organic EL elements, FLC (Ferroelectric Liquid Crystal) elements or FEDs (Field Emission Diodes) other than above-described organic EL elements.

Many widely different embodiments of the present invention may be constructed without departing from the spirit and scope of the present invention. It should be understood that the present invention is not limited to the specific embodiments described in the specification, except as defined in the appended claims.

WHAT IS CLAIMED IS:

1. An active matrix type flat-panel display device comprising:

a flat substrate;

a plurality of light emissive elements arranged two dimensionally along columns and lines on said flat substrate;

a plurality of selection switches formed on said flat substrate, for sequentially selecting said light emissive elements to provide video signals thereto;

selection signal generation circuits for providing selection signals which drive said selection switches in sequence so as to two dimensionally scan the light emissive elements; and

a selection signal control means for preventing said selection signals to be outputted from said selection signal generation circuits for a predetermined period of time so as to eliminate overlap between the selection signals.

2. The device as claimed in claim 1, wherein said selection switches consist of column-selecting transistors arranged for the respective columns of said light emissive elements, and line-selecting transistors arranged for the respective light emissive elements.

3. The device as claimed in claim 2, wherein said column-

selecting transistors and said line-selecting transistors are formed by thin film transistors.

4. The device as claimed in claim 2, wherein said selection signal generation circuits include a first shift register for providing the selection signals in sequence to said column-selecting transistors, and a second shift register for providing the selection signals in sequence to said line-selecting transistors.

5. The device as claimed in claim 1, wherein said selection signal control means includes a mask signal generation circuit for producing a mask signal with a duration of time which corresponds to said predetermined period of time, and a logic circuit for shortening a duration of said selection signals by the duration of the mask signal.

6. The device as claimed in claim 1, wherein said predetermined period time is equal to 5 to 50 % of a half clock cycle.

7. The device as claimed in claim 1, wherein said light emissive elements consist of organic electro luminescent elements.

8. The device as claimed in claim 1, wherein said light emissive elements consist of non-organic electro luminescent elements.

9. The device as claimed in claim 1, wherein said light emissive elements consist of ferroelectric liquid crystal elements.

10. The device as claimed in claim 1, wherein said light emissive elements consist of field emission diodes.

ABSTRACT OF THE DISCLOSURE

An active matrix type flat-panel display device includes a flat substrate, a plurality of light emissive elements arranged two dimensionally along columns and lines on the flat substrate, a plurality of selection switches formed on the flat substrate, for sequentially selecting the light emissive elements to provide video signals thereto, selection signal generation circuits for providing selection signals which drive the selection switches in sequence so as to two dimensionally scan the light emissive elements, and a selection signal control circuit for preventing the selection signals to be outputted from the selection signal generation circuits for a predetermined period of time so as to eliminate overlap between the selection signals.

Fig. 1

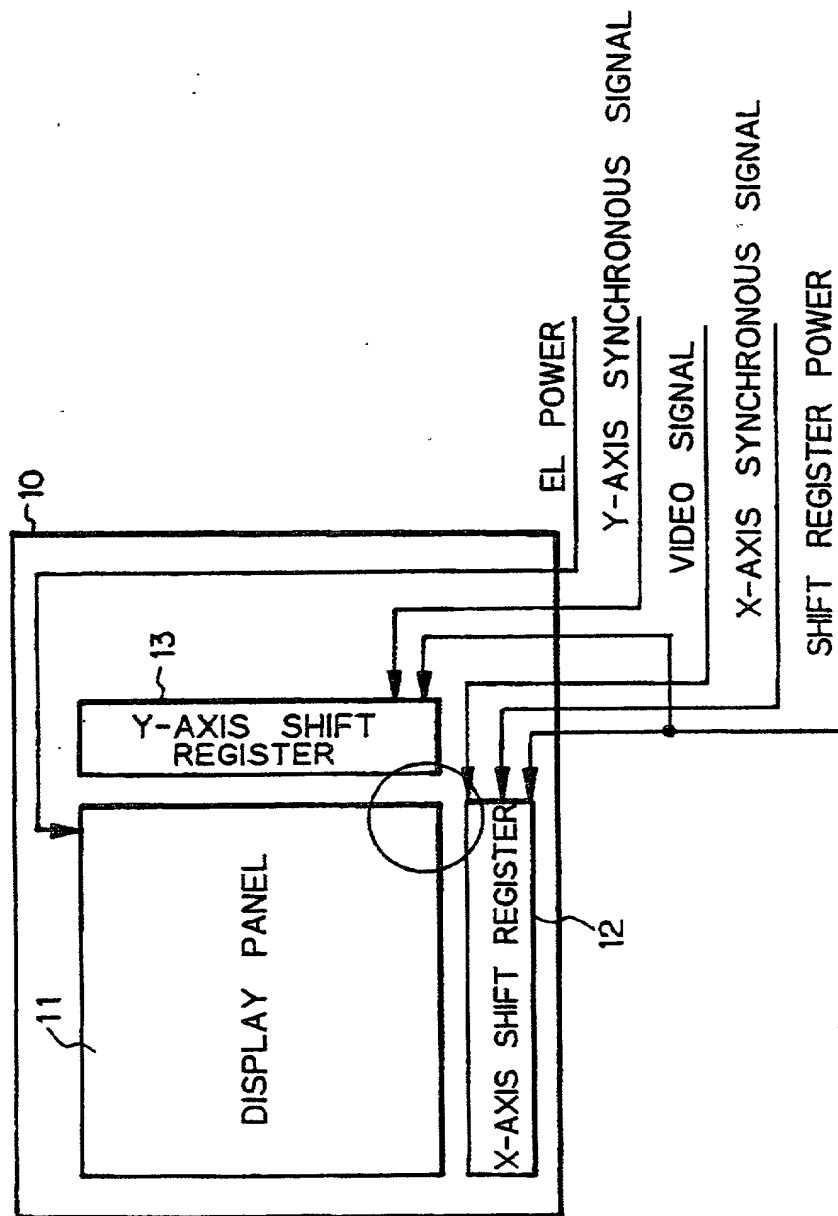
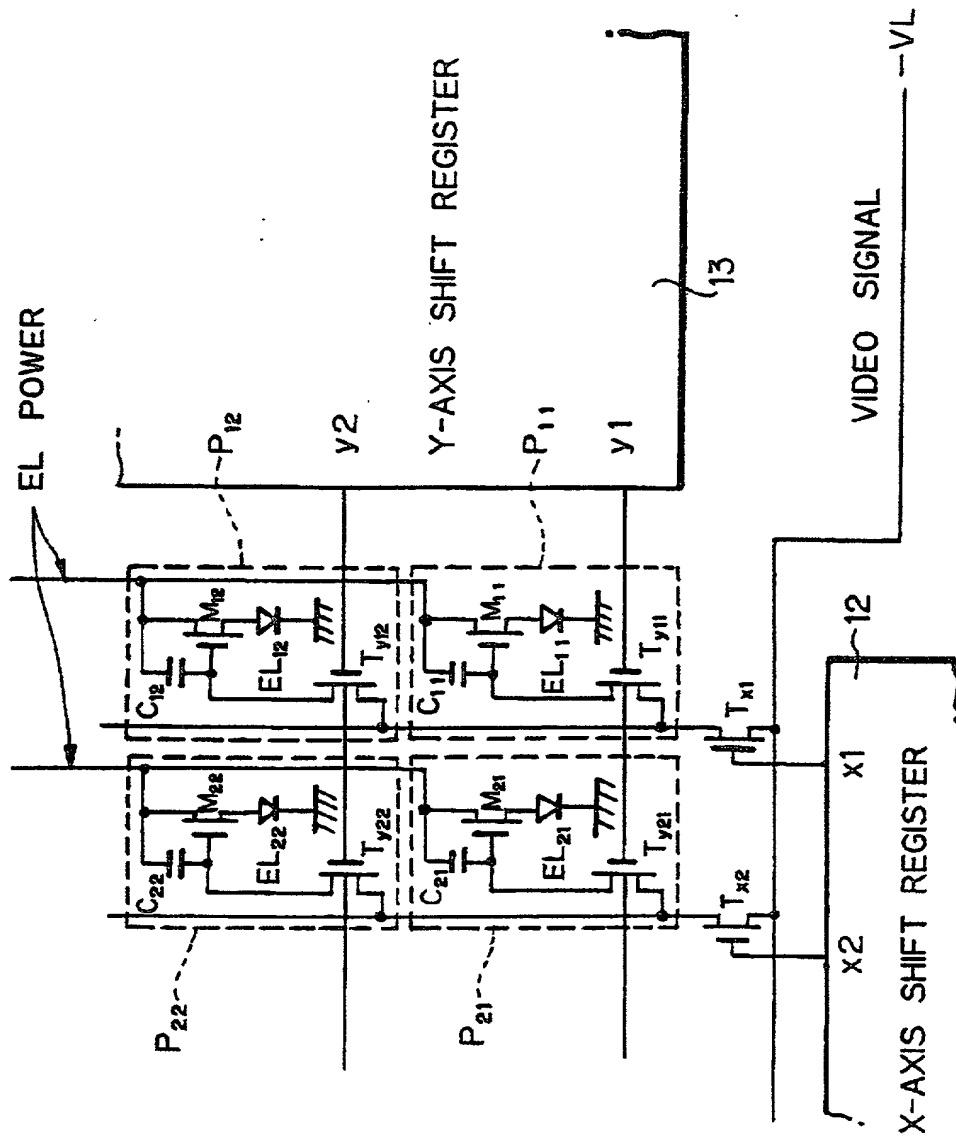


Fig. 2



Year	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

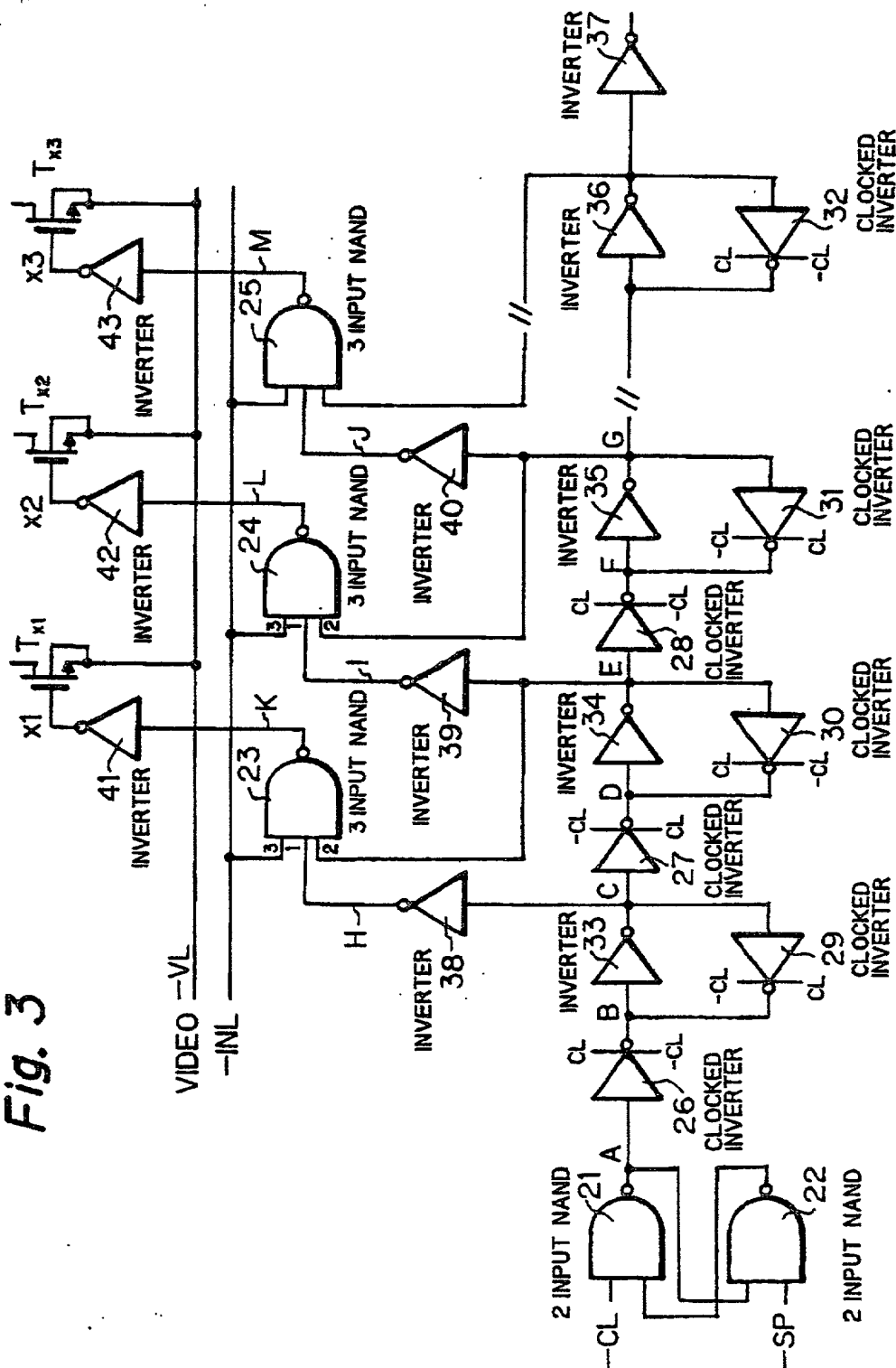


Fig. 4

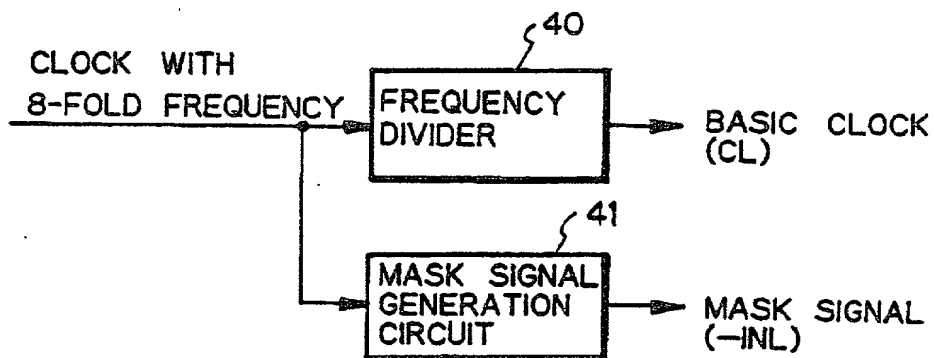


Fig. 5

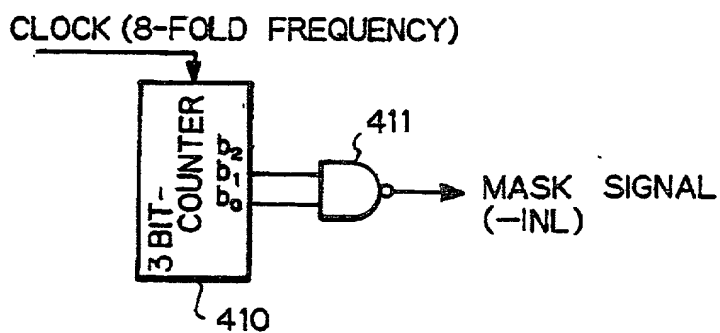


Fig. 6

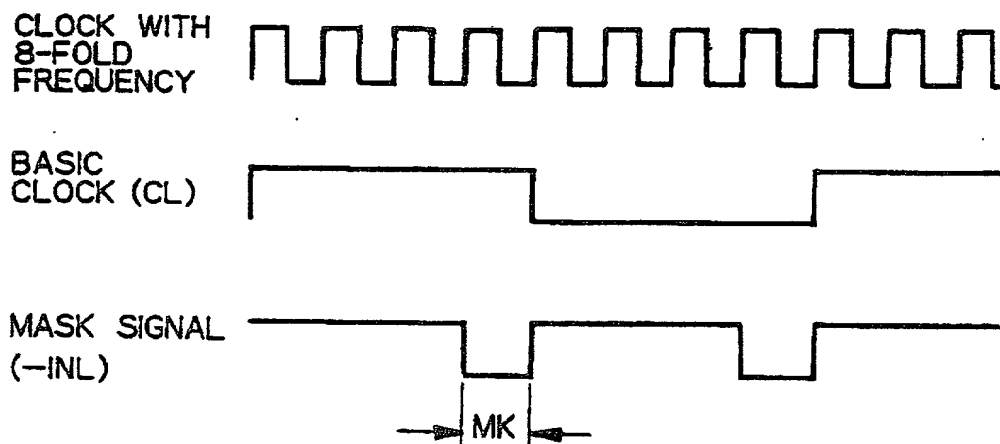


Fig. 7

